

# Why Cost Analysis?

February 2007

**You may be asking yourself; “Why do I care about cost analysis. I don’t place government contracts where a cost breakdown analysis is required. The seller’s bottom line price is all I need to know.”**

**You have a good point. It would be very nice to only have to worry about the final price; but consider these examples:**

- 1. The seller calls to say that because of a 10% world-wide price increase for copper, the selling price of the valve must be raised by 10%**
- 2. The seller announces that his utility company has raised electric rates by 10% because of a water shortage and so all of his selling prices are being raised by 10%.**
- 3. Your maintenance manager decides that he does not need the \$10 gasket and the seller agrees to reduce the selling price by \$10.**
- 4. You agree to accept the valve unassembled so your inspectors don’t have to take it apart to inspect on receipt. The seller claims that will result in 1 less hour of labor at \$9.00 per hour and so reduces the selling price by \$9.00.**
- 5. You have a chance to back-haul the shipment from the seller’s plant on one of your trucks. In exchange the seller agrees to reduce the selling price by \$175 – the actual cost of commercial transportation.**
- 6. Because you are in the food service business, sellers are required to use very expensive food-grade grease that is only available in 5-gallon pails. The seller raised the price of his normal roller assembly by the value of a 5-gallon pail of the special grease.**
- 7. The seller calls one week before the valve is due to ship and says in order to make the delivery schedule he will need 4-hours of overtime for the shop to rework a defective casting.**

**True, you may not have to prepare a cost breakdown analysis before awarding your order – but in each of these real life situations, the more you know about the seller’s cost, the better.**

**Using the above scenarios, here are a few reasons why knowing the cost breakdown might help:**

- 1. Sure, the price of copper may have risen 10%. But the copper part of our valve is only a small percentage of the total price. You know that the seller adds indirect overhead costs on top of the copper material, plus G&A, plus profit. Thus, if the copper part is only worth \$10 then you only want to agree to a \$1 increase not a 10% increase to the whole selling price.**
- 2. Utility costs are generally included in G&A expenses and added to the selling price. But Utility costs are only a piece of the G&A adder. So even if it might be appropriate to pass along the whole utility price increase (and it might not be for a lot of reasons) the 10% increase should only be allocated based on the net change to G&A. example: utility costs are \$500 (per year) and other G&A expenses are \$500 so a 10% net change to utility costs means that the total G&A pool rises to \$1050 (only a 5% increase to the pool).**
- 3. A \$10 gasket has been incremented by overhead, G&A and profit adders and could be worth \$13 by the time it gets to the bottom line.**
- 4. Obviously – requesting that the valve not be assembled will save some amount of labor – but how much time is that per valve? Is it just assembly, or does it also affect time for cleaning, testing and packaging. Don’t forget that labor charges will have an indirect overhead component added, plus G&A plus profit. So even if we save an entire hour of time, the time is worth much more than just the direct wages of the laborer.**

5. Is the commercial transportation a separate adder on top of all the other components of the selling price? If so, it's easy to compare with other transportation options if you know how much the transportation was quoted in the first place.
6. Sometimes it just makes sense to supply a specialty commodity to the seller instead of paying the seller to procure it on his own. In this situation we end up paying for a lot of wasted grease (plus cost adders). Our option is to supply the seller with a small amount of grease to use on the job and cut the grease expense completely out of the price.
7. Casting defects happen all the time and generally allowances are made as part of a normal casting process. Was there a backup casting poured? Is there already rework time and labor allowances included in the price? Even if not, the casting defect should have been discovered early in the production process not at the last minute. Also we'd want to know which labor category has to work overtime because some are paid at different rates.

Have I convinced you that in some cases it would be helpful to have a cost breakdown of a seller's proposal even if it wasn't needed it to satisfy a procedure? Having the cost breakdown - or at least a good idea of the process and cost adders can open a lot of doors in a negotiation. Process knowledge can also help spot delays and impacts to the job much earlier - when corrective action will be more helpful. Understanding the cost breakdown will also help us correctly identify impact of price increases or specification changes.

**IMPORTANT NOTE:** It is much easier to find out what a seller's true production expenses are before you place an order. I consider Fact Finding before placing an order mandatory – it's not an optional exercise. The more you know before you buy - the better. We'll talk more about fact finding later.

**Mt**

# Cost Counts

January 2007

A few years ago I read an article about a purchasing agent at Costco. It highlighted an important cost-related negotiation strategy that I had seen every time I walked through Costco, but failed to recognize.

As well as many other products, Costco sells really big, 8 lb boxes of breakfast cereal. In addition to being enough cereal to last a few weeks, the unit price [price per corn flake] to customers is significantly lower than the small boxes in the local grocery store. The big boxes are on the shelf not just because Costco has extra room – but because the Costco purchasing agent negotiated for big boxes, lowering the overall cost *[then shared the savings with customers]*.

Consider packaging for example. Each box of breakfast cereal includes a printed box. The colorful boxes aren't cheap and the cost of each box gets added to the selling price of the product. By obtaining cereal in 8-lb boxes, the buyer gets more product and many fewer boxes. Not only are there fewer boxes, there is less handling of the product in the factory and fewer secret decoder rings *[I wish I still had my decoder ring]*. In fact, the cost savings go much further.

Consider the other costs which are reduced by the change in packaging. The producer only folds, glues and fills one big box instead of many little boxes. Costco ends up storing a large quantity of cereal on the shelf in those big boxes which moves the inventory out of the producer's warehouse. The product is shipped once a month on a large pallet instead of once a week in cartons. The shelf is stocked only once a month, not once a week. Costco only has to scan and sell the product to customers once a month instead of once a week. Costco only processes one purchase order, invoice and payment instead of many. You get the idea.

In this negotiating strategy the buyer and seller have identified and either eliminated or reduced significant cost elements. Then they split the cost savings so that the producer may even make more profit on the product and the buyer gets a much lower unit-priced product to sell to his customers. Instead of costing 10 cents an ounce, the corn flakes now might only cost 7 cents - so the producer, Costco and the consumer each save a penny an ounce [and in an 8-lb box those pennies add up].

By negotiating a change to something as simple as the packaging size, Costco and the producer have effectively reduced many associated costs of handling, storage and freight. And so it is the same in every item we purchase. There are many little costs which get added in to the final selling price. If we can negotiate a change to reduce one or many of those costs, the overall unit price can be significantly reduced.

Next time you negotiate a long term purchase, instead of arguing about a few cents discount off the asking price, negotiate a lower the overall cost.

How? An easy way to explore this negotiation strategy is by looking at the products you purchase on a regular basis and thinking about packaging.

1. Start by calculating your current unit price for the product. What is the consumer's cost per corn flake? You may even also want to include some of your costs to use the product – such as waste or handling. This is important because you'll need to reevaluate this to see the impact of every proposed change.
2. Is there packaging that gets discarded or does not add value? Could be the box, internal wrapping or those nasty little foam pellets. [true confession: I once purchased O-rings in special kits of 10

for several years and paid extra for the special packaging. Then I found out we had stopped using them in kits of 10 and spent a lot of time repacking them after delivery. So we paid extra for packaging that cost us even more after delivery. That was a no-brainer to fix once I figured it out]

3. Can you use the product in bulk packaging, less packaging or even with no packaging?
4. Could the product be useful if it was delivered in another form instead of the current packaging? Example: a kit instead of individual components.
5. What are other packaging or delivery options? Remember a consignment inventory is just a different delivery option.
6. Now take the big leap in negotiating strategy and bring in your best supplier. Ask to talk with the most experienced, knowledgeable and creative people the supplier has. Bring along your most experienced people who handle and use the product. This is the team.
7. Instead of attacking, start the negotiation by explaining the goal of the investigation to your new negotiation team.  
*Goal: "I want to work together with you to see if we can reduce the overall unit price of the product by changing the costs of packaging and delivery. If we find savings to share, it would mean a lower unit price for me and an increase in unit profit for you."*
8. Then compile a complete list of questions to discuss, starting with items 1-5 above. I'll bet your negotiation team will think of many more costs to question associated with packaging, storage and handling. Remember your supplier may have hidden costs you are not aware of [storage, tax, spoilage, inventory loss]. Also keep in mind that some changes could actually increase cost in the short term in order to achieve big savings in the long term.
9. Once you have a full list of questions, start brainstorming alternatives. Remember the rules of brainstorming – every idea gets heard – no matter how strange. Two or three strange ideas could evolve into a significant process improvement. Consider the first Costco buyer who suggested a huge box of corn flakes. Turned out to be a winner.

Experienced buyers understand that the overall cost of a product or service is where the big money savings hide. Happy hunting.

Mt

# 100 or Not?

January 2007

**Q:** When is an equipment order for 100 items not really an order for 100?

**A:** Whenever we ordering items with unique production requirements, items made with castings or forgings, delicate or fragile items and items with a shelf life. Surprisingly, 100, is not an exact number to many manufacturers, producers and even distributors. An order for 100 8-inch gate valves could easily generate production, testing, transportation and storage of 110 gate valves.

These 10 extra valves are ghosts in the supply chain created to accommodate a variety of potential problems. The problems and the number of resulting ‘ghosts’ vary based on the types of products, manufacturing techniques and risks associated with handling, transportation and storage. Here are a few examples why ghost items are created

- **To cover production process risks:** Not all castings come out perfect, and the casting process can be very expensive. So, when casting large, complex or time-consuming items, casting producers will regularly “pour 2 – so that they can be assured of getting one good one”.
  - Why? Because if one casting fails, they have a backup instead of having to start from scratch.
  - How does the producer pay for the extra work involved in making two castings? Include it in the price.
  - What happens to the extra casting if both are good? It could end up on the shelf waiting for the casting producer's next order – and if you are not careful you will pay for it again – just like new.
- **To cover shop scrap rates:** Mistakes happen in the shop. In machining processes, working on a group of parts is much less costly than doing them one at a time. If, on the average, our machinist makes a mistake on 1 part in every 100, then by starting with 101 or more parts, machine shops can allow for the scrap and still get 100 good parts.
- **Handling and storage loss.** Are these items delicate or subject to high theft rates? If so, suppliers produce and ship some extra, just to cover the ones which might get broken or lost
- **Inventory shrinkage.** Over time, many items being stored in warehouses end up lost, broken or stolen. Ask anyone in the retail business about the cost of shoplifting. So retailers and distributors stock extra items o make up the difference.

In all of these examples the supply chain will, at some point, contain more items than we have ordered.

**Q:** What happens to the extras?

**A:** They might get scrapped, recycled, sold for a discount or end up on the shelf waiting for the supplier's next order.

**Q:** Who pays for the extra items?

**A:** We do. The extra cost is added to supply chain either as a direct “allowance for overages” or an indirect cost of supply and distribution.

**The principle:** An order for 100 items – may actually generate production, storage & handling costs for more than 100 items. The extra cost of creating and handling these extra ‘ghost’ items, gets passed along to the buyer. Interesting to note, the more complex the supply chain the more likely that these costs get compounded as each supply chain process generates its own risks and adds ‘ghosts’ to cover those risks.

**Corollary:** One of the ways that suppliers can be more competitive is to be more efficient and reduce the need for ghost items – thus lowering the cost of doing business.

**Q:** Does this principle apply to contracts for services?

**A:** Yes, in many service industries contractors employ or retain additional workers beyond the bare minimum needed to do the job. Contractors employ contingency staff to maintain continuity of service. Examples:

- The general contractor who has to worry about members of his crew calling in sick or being injured. While he may not have to pay the sick worker, the contractor has to have other workers on call and has already incurred costs associated with recruiting, hiring, equipping, training, etc..
- A training organization has substitute instructors on call, who have been recruited, interviewed and retained.
- A delivery company has extra truck drivers, delivery persons and warehouse operators on call or available. They can’t just put anyone in the truck, they have to use trustworthy drivers who meet DOT licensing regulations.
- A security service has to have guards on duty at all times. They can’t just bring someone in off the street. Extra guards have to be vetted, trained and equipped.

**Q:** Who pays for the contingency staff? If I only want one truck driver who pays for the extra person?

**A:** You pay. The cost for the extra staff ends up in every contract, even if we don't use the extra people.

Can you see the trend? In delivering products or services, quantities are often not exact. The costs of those variances in quantity and maintaining contingency staff are passed along to buyers. The extra costs might be hidden, where a production operation starts with 110 parts to cover production losses or the extra cost might be much more direct; where a contractor adds an extra charge to give our job priority over another customer.

**Q:** What can we do to reduce or mitigate the extra costs?

**A:** a) Understand the hidden costs which might be included in the price and try to negotiate agreements which reduce or eliminate the need for those hidden costs. b) Assist suppliers in finding ways to be more cost-efficient. c) Increase efficiencies and reduce complexity in the supply chain. d) Communicate with the supplier to mitigate the need for contingencies.

**How do we proceed?**

The most important part of reducing cost is detailed information. The Fed calls it fact finding, I call it supply chain professionals taking the time to add value:



1. Learn everything we can about the product or service we will be procuring. Go on a plant tour, ask questions about the processes and explore production costs. Example: Ask the production manager what his shop failure or rework rate is – he'll know and be proud to tell us how low it is, while the salesman may not have a clue. *True confession: On a plant tour, we walked into a shop production office just after their weekly production meeting. All the information we wanted to know (and the salesman wasn't telling us) about order status, rework rates, etc. was still on the chalk board.*
2. Look at each part of the process in an analytical way to determine how we might accomplish the same task or what expenses suppliers have in performing the service. Example: "I see that you have to bring in all of the raw material via truck – what's the contingency in case of snow?"
3. Visualize supply problems in terms of the cost – then follow the money. Example: We all have experienced a substitute teacher. But have we ever considered how schools manage that extra cost? Where does it end up in the budget? Now consider how suppliers of security services or truck drivers might manage the same costs? Someone has to pay for it – who and how?
4. Investigate and map out the entire supply chain. Then start noting where 'ghosts' might be hiding. Look for risks of loss or failure and ask how those risks are addressed. Example: "how do you accommodate days when one driver is sick?" or "Knowing that the part could be rejected during machining, how do you keep from having to start over?"
5. Visit other suppliers of the same product or service. We might learn new facts about the process or gain insight into alternatives. Example: We might see an order being prepared for another customer – where the buyer had specified a less expensive testing or packaging process.
6. In the solicitation phase of the action, ask for a detailed breakdown of everything. Examples:
  - a. An initial compliment of spare filters might be included in the purchase, but how much will they cost when I reorder them? I want to know before I buy the equipment. My total cost of ownership might be very high when I consider the long-term cost of filters. Accordingly, I might want to negotiate a long term agreement for replacement filters as part of the original purchase.
  - b. The manufacturer ships unfinished products to a testing company on the east coast before assembly. Wow! what a high extra cost (risk of loss, handling, storage, time, freight, and volatility in the testing subcontract). If I can find a way to avoid the testing or have it performed elsewhere, we can save money.

Now assemble the negotiating team and include experts from the supplier, producer, etc. We are a team negotiating together to create the best and most cost effective agreement. First Question for the team: What are the facts? Is this really what happens? Are these really part of the costs that we will be paying for, in this agreement? Now discuss how to eliminate, reduce or mitigate those costs. Here are some ideas based on our examples above.

1. If the supplier's shop failure rate is really 8%, then let's include a variance in the order of plus or minus 8%. Anything over 100 – I get at ½ price and anything down to 92 completes the order. This reduces manufacturing risk and I should get a better base price with an opportunity to get a few more at a lower price.
2. If you are really going to pour an extra casting or two, I'll purchase any extra raw castings from you (if they are good and if I know what a good price should be for the castings). Then I can supply the raw castings to you when I order this item again. In exchange for reduced risk, I'll get a lower purchase cost this time and a contingency which might greatly reduce lead time or cost on my next purchase. *True confession: I once purchased the mold for a large specialty casting so that it wouldn't get lost and become an extra charge item on future purchases. It also came in handy when the manufacturer went out of business and I had someone else make the part.*
3. If you really have to buy a 20 foot piece of material (and of course charge me for all 20 ft) to cut my 12 foot order, then I'd like to take the 8 foot drop instead of letting you keep it. I can sell it for scrap or use it for something else.
4. If you really have a problem with inventory shrinkage, then let's put the inventory in my secure warehouse and just charge me for what I use.

5. Instead of a firm date for cleaning our AC ducts, how about we agree to a open window in the schedule? We should get a discount for reducing the supplier's need for contingency staff by accepting flexibility in performing the work.
6. Instead of delivery required on Tuesday – we can accommodate delivery anytime that week.
7. We have a person who can fill-in as instructor for a few hours on this class, in exchange for a discounted price and reduced charge during the time the supplier's instructor is unavailable.
8. We have a testing contractor here in this state. We'll negotiate a way to handle the testing for you since we get a better price and can control the schedule. This will reduce the need for “ghost” schedule days in my delivery.

There are many more ways to creatively spot and mitigate the costs of ghosts in the supply chain. But what about the other direct costs which aren't hidden at all? Can those be reduced or eliminated? The basic answer is YES! An effective buyer will consider each and every cost in the supply chain a target for reduction or elimination. We'll talk more about this next time.

**Mt**



# All costs are not created equal

February 2007

When I purchase a valve or hire a contractor to clean the HVAC systems in our office, the direct costs are generally very obvious. There is the cost of the castings which become valve parts, the machining processes which make the threads, hardware, paint, testing, packaging, etc. When cleaning the HVAC system I can see the people working, hear the big truck run, observe the filters being installed, etc. These direct costs elements either become part of the end product or are incurred by the seller directly as a result of my order. Obviously I expect to pay for the castings, machining, filters and labor hours needed to clean my HVAC ducts.

Direct costs are generally easy to identify and relatively easy to calculate – even in the case of costs which I should only pay a small share of. The paint on my valve is only a fraction of the 5-gallon can of paint and the screw is only one piece from a much larger box of screws. Regardless, I can see the paint and know that I will have to pay for it. Likewise, the wages of a craftsman or laborer who builds my product are easy to track. Direct costs are those expenses that a seller can directly allocate to my contract and/or would not have incurred if he wasn't working on my contract.

Direct Costs are obvious targets for cost reduction. Change the design to leave the screw out and save the cost of the screw. Use a new, faster machining process and reduce the labor cost. When trying to reduce direct costs, the sky is the limit. The more creative we can be in avoiding the direct costs, the bigger the possible reduction.

But, don't forget that sellers also incur indirect expenses in order to provide products and services. The laborer, who gets paid \$9.00 per hour, also receives fringe benefits in the form of insurance, vacation and sick leave. Obviously I owe the supplier \$9.00 for each hour the laborer works on my job, but it certainly isn't fair for me to pay the whole value of the laborer's fringe benefit package. The seller may also be incurring expenses for a foreman, union dues, uniforms, training and certification in order to have the laborer available to work on my contract. In the case of the screw, there is the expense of storing and inventorying the box of screws and even the salary of the Buyer who purchased the box. These indirect expenses are not just part of my contract; they become indirect costs in every valve produced or HVAC duct cleaned.

Indirect costs are those costs which are part of multiple contracts. If the seller only charged us for the direct costs (the casting or screw to put in the valve) then the seller would soon go broke. So how can sellers accurately allocate the portion of a Buyer's time which should be charged to me as opposed to other customers? One answer is by using **indirect cost pools**. An indirect cost pool is a grouping of similar expenses that gets allocated equally across all of the work performed during the accounting period.

So in our example; if the seller's purchasing department cost him \$90,000/year to operate, then the seller can recover the cost of the purchasing department by splitting the \$90,000 equally between the direct material costs of all of the valves he makes for the year. That is, if the total direct material cost (screws, castings, paint and hardware ) sold in a year works out to \$ 4.5 Mil then the seller can recover the cost of his purchasing department by adding 2% to the cost of materials on each order. (2% of \$4.5 Mil = \$90,000) So if the materials in my valve cost \$20 the seller would charge me \$2.40 [ $\$20 + (2\% \text{ of } \$20)$ ]. Thus a share of the material overhead expense gets allocated as an indirect cost to each order for the year.

There are also other types of overhead expenses which can be associated with a specific cost in the production process. The laborer's fringe benefit package generally is allocated as a labor overhead rate.

So while the laborers machining and assembling the valve may only be paid \$9.00/hour, I would be charged \$9.00 plus a percentage of their fringe benefit expense. So the bill would read 5 hours @ \$9.00 = \$45.00 plus .35% (fringe allocation) that is \$45.00 +15.75 =\$60.75

In addition to purchasing departments, sellers also have many other General and Administrative (G&A) expenses required to support the overall operation of the business which are pooled together and charged to each customer. The G&A expense pool usually includes elements such as utilities, the accounting & marketing department and the CEO's salary.

General expense pools are usually charged as a percentage of the total of all the other direct and indirect overhead costs. Even though this is an incomplete picture, let's assume that the total of all direct and overhead costs in a year is \$10 Mil and the total of the G&A pool is \$1 Mil. So our G&A adder rate then needs to be 10% in order to make sure we have fully recovered the G&A pool by the end of the year.

To reiterate; even if the seller charges me exactly what it costs him to make the valve – he will go broke unless he also recovers all of his other indirect costs as part of the selling price. The corollary is also true - when I purchase a valve - I pay for much more than just the cost of the materials and labor to make the valve.

Using our example above, the selling price of the valve would be calculated this way:

Cost Element	Value	Extension	Running Total
Material	\$200	\$200	\$200
Material Overhead	2% * \$200	\$4	\$204
Labor	5 hrs @ \$9.00	\$45	\$249
Labor Overhead	35% * \$45	\$15.75	\$309.75
Subtotal		\$309.75	\$309.75
G & A	\$10% * \$309.75	\$30.98	\$340.73
Subtotal		\$340.73	\$340.73
Profit	15% * \$340.75	\$51.11	\$391.83
Total Selling Price			\$391.84

O.K. so you can see how this all starts to add up. Instead of \$245 for materials and labor we end up paying \$309.75 (give or take a few tenths of a cent.)

There is much more to talk about with respect to costs – and we'll leave that for another article, but there are a few points I want to make now.

1- Notice how indirect costs get lumped together on top of the direct costs. What this means to a negotiator is that a dollar saved in direct cost can save much more at the bottom line. In our example above a dollar of direct material is worth \$1.29 at the bottom line ( $1.00 + 2\% + 10\% + 15\%$ ) [materials +

**material overhead + G&A + profit]. Saving one hour of direct labor ends up saving \$15.36 on the bottom line (\$9+35%+10%+15%).**

**2- Companies use different accounting methods for gathering and liquidating indirect cost pools. Not all companies use the same indirect cost pools. Key points are consistency, grouping similar types of expenses and ensuring that expenses which should be shared across multiple customers are not charged to just one. Companies can have different accounting practices – within certain limits.**

**3- There could be other indirect costs pools added on top of direct costs. Example: Acquisition and inventorying costs are sometimes added as a separate pool. Might make sense for a company that has a large procurement organization for their regular business, but wants to be more cost effective when quoting on consulting services.**

**4- Companies set up an accounting system based on how they want to best recover their expenses and ensure they make a profit. By understanding how the supplier's accounting system is allocating costs, buyers have the opportunity to make more significant impacts in their negotiation strategy.**

**5 – The examples above are not intended to recreate accounting 101 – just to demonstrate the basic principles involved.**

**6- If want to learn more precisely about accounting – sorry, it won't be from me. This is where the lawyers would insert extensive small-print disclaimers.**